

To: S. David Freeman, Chairman of the California Power Authority

From: Karen Griffin, and David Vidaver for Energy Commission technical staff

Date: September 18, 2002

Re: Comments on September 10, 2002 Statements on Reserve Levels

Background and Summary

Thank you for the opportunity to continue the dialogue begun in your proceeding on the CPA's target reserve margin. On September 10, 2002, you sent a list of seven statements to other state agencies and inquired whether these formed the core of a consensus position on reserve margins. We were asked to respond on behalf of the Energy Commission's technical staff. As stated in your cover memo, these informal comments do not commit the California Energy Commission. In general, the statements were consistent with approaches that the Energy Commission has followed over the last several years. In the detailed comments below we add some refinements and clarifications.¹

Response to Statements

1. Reserves must be the responsibility of the load serving entities (LSE).

Energy Commission staff agree that LSEs must bear the responsibility of ensuring that adequate reserves are available to ensure the reliability of the system. Reserves should be secured far enough in advance of real time to (1) minimize exposure to spot markets for reserve capacity and (2) forewarn the control area operator of possible reserve shortages. Any obligations imposed on LSEs should be designed to achieve reliability targets at the lowest possible cost to ratepayers.

Obligations on the LSEs to secure capacity must be accompanied by similar obligations on generators to provide energy when asked to do so. Allowing generators to deviate from day-ahead and hour-ahead schedules without penalty increases the use of reserve capacity and threatens the reliability of the system.

The nature of the LSE obligation, including the level and timing of reserve procurement, allocation of reserve requirements to individual LSEs, allowable costs, penalties for failure to meet reserve requirements, reporting requirements, and all other obligations imposed on LSEs in the course of ensuring adequate reserves are under the jurisdiction of the state's Public Utility Commission and the municipal utility boards.

¹ **Terminology** -Definitions of the terms used by Energy Commission staff in discussing reserves are defined in the appendix at the end of this document.

2. Reserves must be from identified power plants or demand reserve programs.

Energy Commission staff agree that operating reserve commitments from supply-side resources must be backed by physical assets and that said assets must be identified where feasible. This will ensure delivery of energy when reserve capacity is called upon, preclude “double-counting” of resources and provide the control area operator with information needed to assess the status of the system, e.g., the quantity of unencumbered capacity on a locational basis, generators possibly in violation of must-offer requirements, etc.

There are several modifications to this general statement when looking at year-ahead/month-ahead reserves. First, ancillary services should be able to be obtained either from self-provided resources or from a recognized market. For example, hydro resources are often excellent spinning resources and it is much more efficient for them to be provided to the market in general than contracted for in minute amounts by each LSE. Second, the LSE should be allowed to purchase system sales as firm imports from credit-worthy sources such as utilities or the Bonneville Power Administration. Third, demand response resources must be obtained on a probabilistic basis. The aggregator may not know exactly which firm will reduce load when called upon. He simply must be able to guarantee that, in aggregate, sufficient demand will respond. Lastly, existing contracts may call for a system sale. As long as the system sale has a reliable track record, there is no reason to discount the firm capacity offered.

In some instances, plant identification may impose unnecessary costs without providing substantial benefits. Requiring that capacity offers, especially long-term and forward offers, be associated with specific plants may substantially increase offer prices and, if the capacity is located outside the control area, provide little in the way of additional reliability. If a seller (1) can show control of capacity through ownership or contract, (2) can show that the required amount of capacity is unencumbered, (3) can guarantee the deliverability of energy, and (3) can choose from a set of generation units without impacting the control area operator’s ability to assess and ensure the reliability of the system, some degree of flexibility in this regard is desirable.

3. The LSE must have a firm contract right to call on the reserves when needed.

Energy Commission staff agree that energy must be available from reserves on a firm basis where feasible. In addition, assurances of deliverability must be provided if transmission congestion or recall by another control area might otherwise disrupt energy delivery.

Standard offer contracts with qualifying facilities (QFs) do not provide LSEs with a firm right to energy; this class of generators provides too large a share of California’s electricity to not be considered as contributing to a reserve requirement.

Intermittent (non-dispatchable) resources cannot provide specific amounts of energy on a firm basis. Their contribution to reserve requirements should be based on a probabilistic assessment of the energy that they are likely to be capable of generating.

The right to call on the operating reserve capacity must be extended, in real time, to the control area operator as well. This right should be subject to the constraint that, in the event that an energy-limited unit (emission-constrained, hydro, hour-limited demand-side resource) is dispatched by the operator due to failure of another LSE to meet its reserve requirements, the LSE providing said unit be adequately compensated.

4. Power plants that are not under firm contract to California LSE's shall not be counted as part of our reserves.

For day-ahead operating reserves, generation not under contract should not be counted. For long-run planning reserves, if the aggregate of generation in the West sufficiently exceeds probable demand, then generators will be forced to sell somewhere. If California generators are free to sell to the Southwest, so are Southwest generators free to sell to California. Consumers benefit when we take into account regional accessibility. As stated in our comments on statement #2, it may not always be necessary or desirable that the specific power plant providing year-ahead/month-ahead reserves be uniquely identified.

Constraints on the sale or withholding of power will influence the extent to which power will be made available in the absence of reserve requirement obligations imposed on the LSEs. Both must-offer requirements and the right to recall exports will increase the amount of power available to California with or without specific reserve requirements.

5. Adequate level of reserves are made up of two elements:
 - Reliability reserves and
 - “Market Control” reserves (or planning reserves)

Energy Commission staff agree that the level of planning reserves plays a role in ensuring reliability. They must be sufficient to ensure operating reserves during periods of high demand even given load forecasting errors and high levels of outages.

While the quantity of operating reserves needed to ensure reliability can be estimated relatively accurately (as can the necessary planning reserves, given a must-offer requirement), the amount of reserves necessary to mitigate market power is subject to debate. This value depends upon numerous time-varying factors, including market structure and mitigation methods; numbers arrived at from a study of one market during one time period cannot be generalized to other markets or other time periods.

The cost of mitigating market power by providing incentives (or requirements) for higher than minimum reserve margin levels must be compared to the costs of achieving the same goal through other means, including must-offer provisions, pricing mechanisms which

induce demand elasticity, etc. In addition, the financial consequences of market power can be substantially lowered by reducing the share of load that is exposed to high prices, perhaps without dampening the incentive to build peaking capacity (see the response to statement #7).

6. Reserves needed for reliability purposes shall be a percentage of net dependable capacity minus forced outages.

Energy Commission staff agree that only dependable capacity should be counted towards year-ahead/month-ahead and operating reserve requirements. Reserve requirements should be based in part on the system average forced outage rate and its variability, as well as on expected load forecasting error, as these influence the probability that a given reserve level will be sufficient to ensure reliability.

Any percentage requirement should be chosen with due attention to the time frames involved. A year-ahead, as compared to month-ahead requirement that the LSE contract for, e.g., 115% of expected peak load greatly increases the amount of capacity that needs to be procured and reduces the flexibility with which LSEs can meet requirements to contribute to system reliability. This may increase costs to ratepayers, without comparable increases in reliability.

7. Additional reserves needed to assure a competitive market depend on the per cent the spot market is of the entire load. If advance contracts cover 95% or more these reserves can be small. If the near time market is larger these reserves must be sizeable.

Energy Commission staff agree that, for fixed levels of reserve capacity, reducing the size of the spot market is desirable if it reduces the financial costs to ratepayers. The need for sizeable reserve requirements in the absence of substantial forward contracting requirements can be substantially mitigated by exposing end-users to prices which reflect the true cost of wholesale energy during peak hours. In addition, as noted in the response to statement #4, such items as must-offer requirements will influence the needed amount of reserves.

Care must be taken not to transfer market power from spot energy markets to capacity markets. Any substantial reserve requirement must be imposed at a pace that ensures the supply of capacity will match increases in “demand.”

Terminology Appendix

“Operating reserves” refer to “that capability above firm system demand required to provide for regulation, load forecasting error, equipment forced and scheduled outages and local area protection. It consists of spinning and non-spinning reserve. (NERC)” Minimum operating reserve levels have been established by NERC and are roughly 7% of load, this level ensures that the lights will stay on if a major power plant or transmission line suddenly fails.

“Year-ahead or month-ahead reserves” is not an industry-defined concept, but is one used by the State of California for the past two years in assessing whether the State was prepared, on a statewide basis, to provide reliable electricity. The Energy Commission’s monthly and yearly look-ahead tables have assessed the readiness of the electricity system by estimating peak needs on a high temperature scenario plus ancillary services compared to dependable capacity, adjusted for known and probabilistic outages, plus firm imports to arrive at an estimate of operational readiness. In addition, we have identified the emergency demand options available to reduce demand, if needed. This is similar to the concept, which the CPA’s statements propose.

This is to be an administratively-determined amount at least as large as the minimum operating reserve (to ensure system reliability in real-time), but less than the planning reserve level (the LSEs collectively will not have to ensure the availability of all the dependable capacity that has been built, nor could they as a share of it will be out for maintenance at any given point in time).

“Planning reserves” are the amount of dependable capacity (or demand-side resources) in excess of load and were set high enough under the “regulated” paradigm to ensure that, even given load forecast errors and high levels of outages, operating reserves will be sufficient at the time of peak load. Planning reserves are usually long-term forecasts, and refer to potential conditions more than a year in the future.